

What Is Claimed Is:

1. A piezoelectric ink jet printer head formed by laminating a plurality of plates, the piezoelectric ink jet printer head including:

- a) an actuator portion being composed of upper and lower electrodes, a piezoelectric plate inserted between the upper and lower electrodes, a protection layer placed on the upper electrode, and a resilient plate disposed beneath the lower electrode;
- b) an ink passage portion composed of a spacer disposed beneath the resilient plate and forming a side portion of a chamber, a channel plate disposed beneath the spacer, the channel plate forming an ink passage in one side of the chamber and simultaneously expanding the chamber, and a nozzle plate disposed beneath the channel plate, the nozzle plate forming the lower side of the chamber and having a nozzle communicating with the chamber; and
- c) an ink-supplying portion formed by a through-hole reaching the ink passage of the channel plate through the actuator portion and the spacer.

2. A piezoelectric ink jet printer head according to claim 1, wherein a tapered portion is formed at the upper part the nozzle such that the cross section of the chamber varies from the chamber to the starting point of the nozzle.

3. A piezoelectric ink jet printer head according to claim 1 or 2, wherein the ink jet printer head is provided with an ink container above the protection layer, wherein a plurality of ink jet head modules are arrayed on a same plane in a matrix fashion, each module being composed of the actuator portion, the ink

passage portion and the ink-supplying portion, and wherein ink is supplied to the chamber of each ink jet head module from the ink container through each through-hole and ink passage.

4. A piezoelectric ink jet printer head according to claim 1 or 2, wherein the resilient plate is formed of ZrO_2 .

5. A piezoelectric ink jet printer head according to claim 1 or 2, wherein the resilient plate is formed of BaTiO_3 .

6. A piezoelectric ink jet printer head according to claim 1 or 2, wherein the resilient plate is formed of Al_2O_3 .

7. A process for manufacturing a piezoelectric ink jet printer head, which is formed by laminating a plurality of plates including a resilient plate having elasticity and a nozzle plate having a nozzle, the process including the steps of:

- a) disposing a resilient plate;
- b) printing a lower electrode on the resilient plate;
- c) printing a spacer beneath the resilient plate;
- d) printing a channel plate beneath the spacer;
- e) sintering the assembly of the resilient plate, the lower electrode, the spacer and the channel plate;
- f) forming a piezoelectric plate on the lower electrode;
- g) forming an upper electrode on the piezoelectric plate;
- h) forming a protection layer on the upper electrode;
- i) forming a through-hole leading to the spacer from the protection layer;
- j) forming a tapered portion in the nozzle plate;
- k) forming a micro-spray hole at the apex of the tapered portion in the nozzle plate; and

1) bonding the nozzle plate and the channel plate to each other.